



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



TEMODRES BESHAH • SAVE THE CHILDREN

## Nutrition Security and Sustainable Income for Vulnerable Households

**E**ating a nutritious diet, one that is rich in micronutrients and provides sufficient energy, is beyond the means of Ethiopia's poorest residents. For families struggling to meet their most basic needs—enough food to ward off hunger, water, health care—purchasing nutrient-rich produce, meat, and dairy or farming tools and seeds needed to cultivate a diverse diet is financially unmanageable. The Empowering the New Generation to Improve Nutrition and Economic opportunities (ENGINE) project's baseline study found that 5 to 15 percent of households in the supported woredas were food insecure or impoverished. Therefore, to improve nutrition in the first 1,000 days of life for children in Ethiopia's most vulnerable households (MVHHs), ENGINE developed a comprehensive package of support to help families overcome the ➤

## ENGINE TECHNICAL BRIEF 1

EMPOWERING NEW GENERATIONS WITH IMPROVED NUTRITION AND ECONOMIC OPPORTUNITIES



**USAID**  
FROM THE AMERICAN PEOPLE

 **LAND O'LAKES, INC.**  
INTERNATIONAL DEVELOPMENT



**Save the Children**

barriers that prevent access to quality food while also addressing the cultural, gender, and other social drivers of malnutrition. Working with local government, the Ministry of Agriculture (MOA), and community organizations,

ENGINE identified 14,380 MVHHs in the four project regions, defined as economically poor and home to pregnant women or children under the age of two, to participate in the activities discussed below.

## IMPLEMENTATION

### Selection and Orientation

ENGINE partnered with *woreda*-level MOA offices to develop the MVHH selection criteria and procedures, which included posting names of selected households at the *kebele* administration offices for one week to allow communities to dispute selections. Once the terms were agreed upon, the government selected the households. This process instilled transparency and the local government's ownership of the intervention.

### Promotion of Improved Nutrition Practices

After receiving training from ENGINE, agricultural extension workers (AEWs) and health extension workers (HEWs) provided one-on-one education to one member of each MVHH on nutrition concepts such as the importance of dietary diversity, food safety, and healthy maternal, infant, and young child feeding practices. Eighty-five percent of these beneficiaries were women.

The extension workers emphasized the importance of diverse, balanced diets for pregnant women and young children and demonstrated how to prepare food using the vegetables the MVHHs would eventually grow with ENGINE's support. HEWs also educated communities about the ways in which some cultural beliefs limit women's and children's diets and promoted healthy nutrition practices.

Throughout ENGINE's lifecycle, the project's social behavior change and communications activities provided MVHHs and their communities with opportunities to learn more about nutrition through cooking demonstrations, enhanced community conversations, counseling, and group education at health posts and farmer training centers.

### Material and Technical Support for Homestead Gardening

Once households were oriented to the project, AEWs trained the families on planting, irrigation, and harvesting techniques for homestead gardens and ENGINE provided basic farming tools and vegetable seeds or fruit

tree saplings. The project selected plants that were both highly nutritious and grew well in the local ecosystems such as, Swiss chard, kale, carrots, orange-fleshy sweet potato, Irish potatoes, beans, head cabbage, pumpkin, apple, avocado, mango, and papaya. Once the gardens were established, the AEWs checked in with MVHHs periodically to ensure the plants were thriving and to help solve problems as needed.

### Material and Technical Support for Animal Husbandry

To ensure adequate consumption of protein and augment income, ENGINE provided MVHHs with livestock and training in animal husbandry; 8,800 MVHHs received three goats or a sheep and a ram, 1,081 received a flock of 12 to 16 vaccinated chickens, and 1,667 households received a heifer. MVHHs were encouraged to breed the goats and sheep to replace the parent stock and then consume or sell additional offspring. Farmers both consumed and sold the eggs produced by their chickens (and occasionally the meat) and the milk from heifers.

### Savings Groups

ENGINE established 654 savings groups in the project *woredas* to help MVHHs invest the income earned from the sale of their crops, animals, or animal products. Each group received training on financial literacy and ENGINE linked them with cooperatives or institutions offering microcredit or other financial services. Members were encouraged to contribute between 5 and 10 Ethiopian Birr per month (10 Birr is equivalent to approximately \$0.50). Groups could then provide small loans from the pooled capital to allow members to make investments such as additional livestock or farming inputs. Savings groups also served as the main platform through which AEWs and HEWs educated MVHHs about improved nutrition, water, sanitation, and hygiene practices and the role gender inequity can have in influencing decisions about the family's diet.

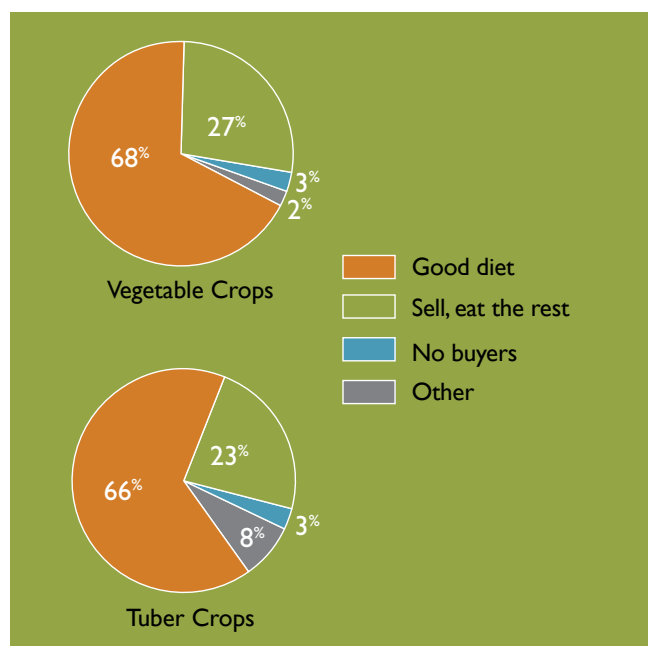


Figure 1. Reasons for consumption of crops

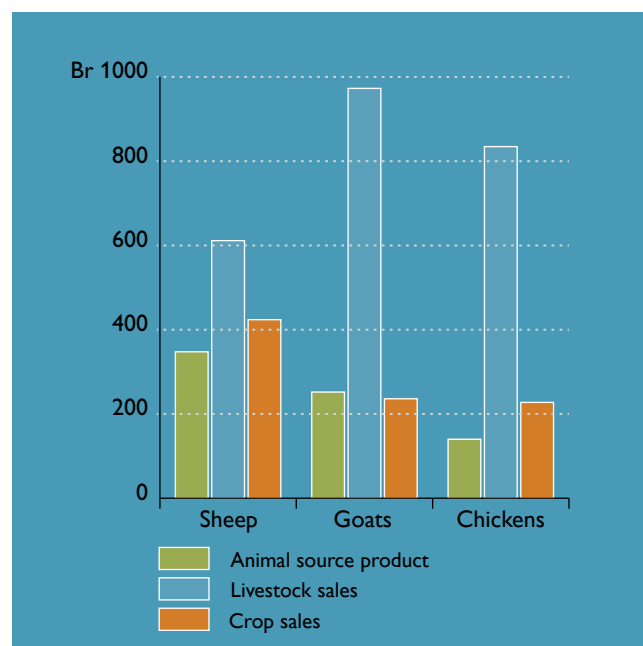


Figure 2. Distribution of income from ENGINE activities (in Ethiopian Birr)

## RESULTS

In addition to routine monitoring, ENGINE conducted two studies to evaluate the impact of the livelihoods activities.

The Livelihoods Effectiveness Study gathered data on households' choices regarding the consumption or sale of vegetables and animals raised with ENGINE support. The project conducted key informant interviews and a survey of 906 participating households in March 2014.

The second study, the MVHH Survey, assessed the impact of ENGINE's livelihoods interventions on 830 participating households' infant and young child feeding practices, maternal diets, and household decision making. ENGINE collected an initial round of data in November and December of 2014 and conducted a follow up survey with the same households in September 2015.

Overall, both the Livelihoods Effectiveness Study and MVHH Survey showed that participation in ENGINE activities correlated with improved nutrition practices.

**Most households ate the majority of their crops and cited their desire to consume a nutritious diet as the reason they tended to eat the most nutritious produce.**

## Findings from the Livelihoods Effectiveness Study

The Livelihoods Effectiveness Study showed that households participating in homestead gardening and animal husbandry improved the diversity of their diets and increased their income. Most households consumed the majority of their crops. One-quarter consumed all the plants they grew and sold none. Three-quarters ate some and sold the rest and just 0.1 percent of respondents sold all of their harvest.

Households cited a desire to consume a nutritious diet as the reason they tended to eat the most nutritious crops, such as beetroot, tomatoes, and orange fleshed sweet potatoes, while selling the less nutritious but more lucrative onions and Irish potatoes (Figure 1). It is notable that despite most homestead gardens' modest size and lack of irrigation, harvests were large enough to provide for both consumption and sale of vegetables.

The sale of livestock and animal products created approximately 70 percent more income than the sale of produce. However, gardening had a greater impact on households' nutrition security, as respondents consumed more produce than animal products. MVHHs who raised chickens consumed the most animal protein; 74 percent of households that received chickens ate eggs and 67 percent of those that received heifers drank the milk.



Figure 3. Comparison of IYCF indicators

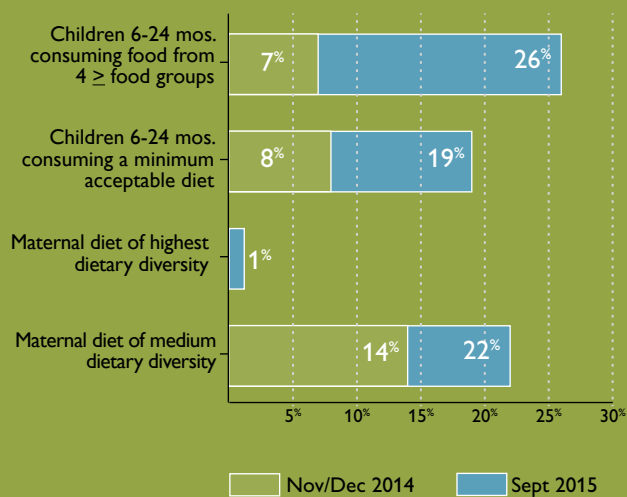


Figure 4. Participation in ENGINE activities and maternal dietary diversity

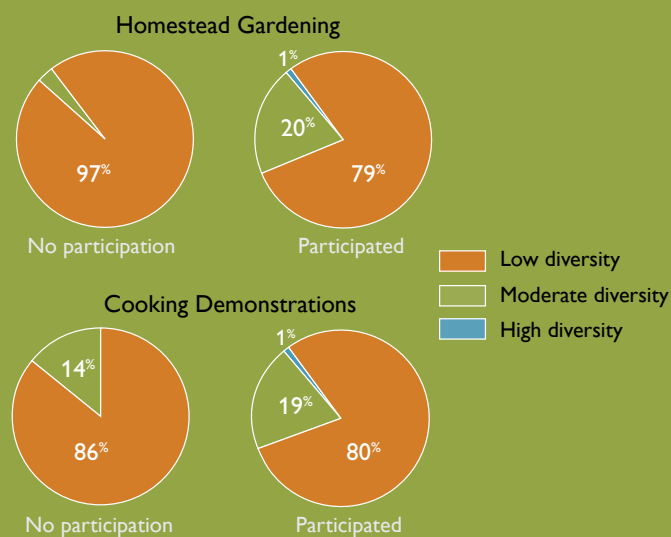
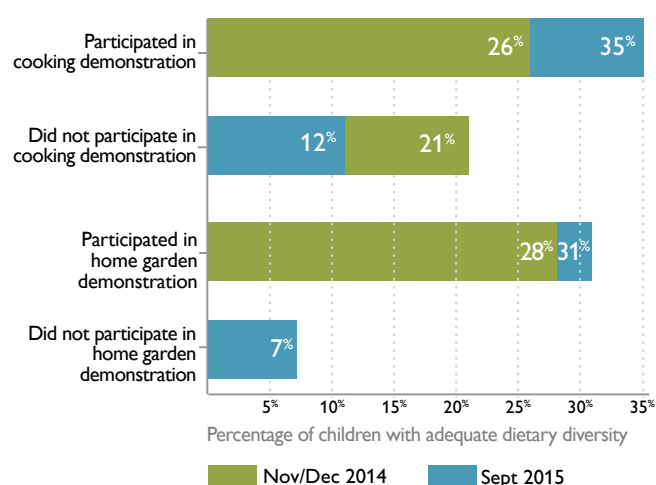




Figure 5. Participation in ENGINE activities and child dietary diversity



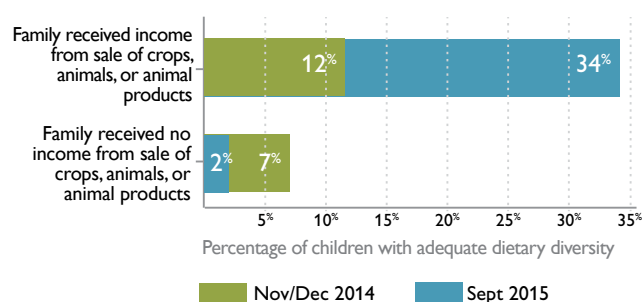
Households used their additional income for agricultural inputs, including veterinary services, educational expenses, home improvements, and hygiene and health costs. Many of these investments have indirect but positive impact on dietary diversity and household nutrition. Thirteen percent of households reported using income from farming and livestock activities to purchase additional food.

## MVHH Survey

The MVHH Survey showed that dietary diversity improved among mothers and their children aged 6 to 24 months in participating households (Figure 3). Unfortunately, the proportion of children who received at least three meals a day decreased from 75 to 72 percent and household hunger increased. The timing of the surveys may have influenced these results, as the 2015 data collection was done in September, in the lean season.

Nineteen percent of women who participated in savings groups had moderate dietary diversity scores, compared

Figure 6. Percentage of children consuming an adequately diverse diet, ENGINE income activity



to just eight percent of women who did not participate in the groups. Women's participation in homestead gardening and cooking demonstrations was also positively correlated with increased dietary diversity for themselves and their children (Figures 4 and 5). The sale of livestock and vegetables was associated with increased dietary diversity in children (Figure 6).

## Discussion

Changing communities' agricultural and dietary practices is an enormous challenge. The choices individuals make regarding when, what, and how to eat are deeply ingrained in cultural norms and habits passed down from one generation to the next. In light of these inherent challenges, ENGINE's livelihoods component realized great success. Growth through Nutrition will apply the lessons ENGINE learned throughout its course of implantation, adapting approaches where necessary and building on ENGINE's successes. A selection of these lessons are discussed below.

## LESSONS LEARNED

### ◆ Nutrition-sensitive livelihood interventions must readily adapt to local customs and preferences.

In the first year of implementation, ENGINE included lettuce among the selection of seeds provided to MVHHs. However, most households did not know how to properly wash and consume the raw leaves, leading to concerns regarding food hygiene. The project therefore removed lettuce from its offerings and instead scaled up the provision of kale, Swiss chard, and cabbage, which are traditionally served cooked in the local cuisine, reducing the risk of transmitting bacteria or parasites and facilitating the complementary feeding of infants.

In some areas of Ethiopia, such as Amhara, drinking the milk of sheep or goats is not customary and education on its nutritional benefits was not enough to convince MVHHs to consume it. Households who raised goats or sheep in these areas therefore benefitted only from the annual or bi-annual sale of fattened sheep or lambs. To provide these families with a more consistent source of nutrition, ENGINE developed a cost-share program that enabled households to purchase a dairy cow, a source of milk more acceptable in local cultures.

Though chickens yielded less income for farmers than larger livestock, they had a greater impact on families' nutrition. Chicken farmers reported eating eggs more frequently than households consumed the meat or milk from their goats, sheep, or heifers. ENGINE thus considers chickens to be the most beneficial form of livestock to improve dietary diversity and increase consumption of animal protein among MVHHs.

- ◆ **Community groups and networks can facilitate behavior change.** Because much of the livelihood component's success was dependent on individuals' changes in behavior, creating a platform for social support and discussion of these issues within the community was essential to catalyze change. The village savings groups provided this setting and the results discussed above clearly show that they were an essential aspect of the intervention.
- ◆ **More study is required to identify effective communications that encourage increased dietary diversity, while also ensuring adequate meal frequency.** Though the MVHH Survey showed some increase in maternal and child dietary diversity after exposure to ENGINE activities, the changes were modest. Even more concerning was the small decrease in meal frequency. One theory to explain these seemingly contradictory findings is that communications may have over-emphasized the importance of dietary diversity to the detriment of meal frequency. Growth through Nutrition will further investigate reasons for these results and adjust its approach appropriately.
- ◆ **Homestead gardening alone cannot improve dietary diversity throughout the year.** In ENGINE's first year of implementation, MVHHs received support for either homestead gardening or livestock activities, not both. However, the project soon realized that few of the MVHHs' gardens were irrigated and thus harvests were limited to about four months per year. The sale of vegetables did not bring in as much income as the sale of animal products, thus farmers who cultivated vegetables alone could not source a sufficient amount of animal-source foods, essential for children between six months and two years of age. ENGINE thus revised its approach and provided all MVHHs with support for both homestead gardening and animal husbandry so that income from the sale of offspring or animal products could be allocated to the purchase of nutrient-dense food in the months when gardens aren't productive.
- ◆ **Innovative technologies are needed to extend growing seasons and the shelf life of produce and animal products.** Irrigating MVHHs' gardens would expand the growing season, thus increasing both the quantity of produce available for sale and expanding the period of time families have fresh fruits and

vegetables available for consumption. Growth through Nutrition will identify ways to increase the availability of irrigation and innovative ways to store and process food that increase its shelf life.

- ◆ **The care and feeding of livestock can be a burden for some MVHHs.** Many MVHHs had little or no grazing land or crop residue to provide their animals, resulting in malnourished flocks. ENGINE therefore trained AEWs on the growth of forage crops such as Sesbania, Tree Lucern, and elephant grass, which can be grown near homes on land that is not generally used for other crops. These crops are high in Vitamin A and other nutrients, leading to healthier, more productive livestock. More than 60 percent of the MVHHs who raised goats and sheep adopted this "backyard foraging" technique.
- ENGINE observed and responded to similar challenges among MVHHs raising chickens. Allowing poultry to roam free near living quarters can spread harmful bacteria, especially to children playing on the ground, one of the causes of childhood stunting. ENGINE therefore required MVHHs to cage all chickens received through the livelihoods intervention. Some farmers objected to this, since it required them to feed the birds rather than allowing them to graze. ENGINE provided an initial supply of commercial feed and then trained the AEWs to teach farmers how to prepare inexpensive, nutritionally adequate chicken feed from locally-available resources, the cost of which was covered by the sale of chicks and eggs.
- ◆ **Though chickens yielded less income for farmers than larger livestock, they had a greater impact on families' nutrition.** Chicken farmers reported eating eggs more frequently than households consumed the meat or milk from their goats, sheep, or heifers. ENGINE thus considers chickens to be the most beneficial form of livestock to improve dietary diversity and increase consumption of animal protein among MVHHs
  - ◆ **More financial training is needed for both households and village savings groups.** Though participation in the project's livelihoods' activities had nearly-universal positive impact on MVHH's income, better budgeting and financial planning could have increased the impact the additional resources had on families' nutrition.







ENGINE has created demand for greater dietary diversity and households are willing to pay to improve their diets.

Village savings groups commonly provide yearly distributions of capital plus interest to their members. ENGINE found, however, that the savings groups it supported were more interested in growing their capital to fund ambitious income generating activities, such as the purchase of dairy cows or small grain mills that would, in turn, generate greater financial return. Yet many groups did not have the basic financial literacy required to plan for and realize their goals. More extensive, ongoing support was necessary for groups to become fully functional. Since the savings group activities started late in the project cycle, many of the groups had not yet received legal recognition at the end of the project, which limited their functionality and ability to receive assistance from financial institutions that would enable them to launch larger income generating projects.

The Growth through Nutrition project will expand support to these groups, providing financial literacy education for the household and group level. The next project will also develop more robust links with lending institutions and explore ways to increase income from the sale of crops and livestock through schemes such as market cooperatives.

- ◆ **To support the local economy, MVHHs should purchase seeds through the private sector.** By not engaging local seed suppliers in the livelihoods activities, ENGINE both missed a chance to stimulate

local economies and to establish a sustainable supply of seeds. Growth through Nutrition will develop a cost share or voucher system to support households' purchase of seeds directly from the private sector.

- ◆ **The livelihoods activities increased dietary diversity among the target population but the scale of the intervention must increase to have an impact on the proportion of children stunted in Ethiopia.** Many families within the project's operating zone did not meet the MVHH selection criteria, but nonetheless struggled to meet their dietary needs. After learning about the benefits of consuming a nutritious, diverse diet from participating MVHHs and through HEW and AEW demonstrations, many of these neighbors chose to self-finance the purchase of vegetable seeds, farming tools, and small herds of livestock from ENGINE participants. ENGINE has created demand for greater dietary diversity and households are willing to pay to improve their diets. Growth through Nutrition will expand its support to small farmers, through a model farmer approach (discussed further in *ENGINE Technical Brief 6: Nutrition-Sensitive Agriculture Interventions*) the Men's Development Army, farmer training centers, school clubs, and adult literacy interventions. ◆

## ABOUT ENGINE

The Empowering the New Generation to Improve Nutrition and Economic opportunities (ENGINE) project was the U.S. Agency for International Development Ethiopia Mission's flagship multisector nutrition project. ENGINE, which was implemented from September 2011 to September 2016, built on the Government of Ethiopia's National Nutrition Program and the U.S. Government's Feed the Future initiatives to prevent undernutrition during the first 1,000 days of life, from the start of pregnancy until the child is two years of age. The project was led by Save the Children in partnership with Tufts University, Jhpiego, Land o' Lakes, the Manoff Group, Valid International, and Jimma University and worked in 116 *woredas* across the Amhara, Tigray, Oromia, SNNPR, and Somali regions of Ethiopia.

ENGINE partnered with Ethiopian ministries to strength existing multisector coordination and support the development and revision of nutrition policies, guidelines, and standards. It integrated instruction on nutrition into the pre-service curriculum for health and agriculture workers and built the capacity of frontline

health and agriculture workers to provide high quality nutrition services. The project's social and behavior change communication activities promoted optimal maternal, infant, and young child feeding practices and dietary diversity at the community level. Work with vulnerable households educated participants about nutrition-sensitive agriculture techniques and livestock management to increase consumption of nutrient-dense foods and augment household income. ENGINE promoted improved water, sanitation, and hygiene practices to prevent diarrhea in children and improve nutritional status, mainstreamed gender in all its activities, and implemented a rigorous research strategy to support and guide effective nutrition policies and practices.

*For more information on ENGINE, contact:*

Dr. Habtamu Fekadu, Chief of Party, ENGINE  
email: [habtamu.fekadu@savethechildren.org](mailto:habtamu.fekadu@savethechildren.org)  
Old Airport P.O. Box: 387, Addis Ababa, Ethiopia  
Web: [ethiopia.savethechildren.net/ENGINE](http://ethiopia.savethechildren.net/ENGINE)